

Invasive Pneumococcal Disease Quarterly Report

January–March 2013

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by
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Introduction

Since 17 October 2008, invasive pneumococcal disease (IPD) has been notifiable to the local Medical Officer of Health under the Health Act 1956. In June 2008, a 7-valent pneumococcal conjugate vaccine (PCV7), Prevenar[®], was added to the New Zealand childhood immunisation schedule. From approximately October 2011, the 10-valent pneumococcal conjugate vaccine (PCV10), Synflorix[®], replaced PCV7 as supplies of the latter were depleted.

PCV10 includes the seven serotypes in PCV7 (4, 6B, 9V, 14, 18C, 19F, and 23F) as well as serotypes 1, 5, and 7F. The recommended schedule is four doses, given at 6 weeks, 3 months, 5 months and 15 months of age.

These quarterly reports are part of an enhanced surveillance programme to monitor the impact of PCV vaccination, including the change from PCV7 to PCV10, on the epidemiology of IPD in New Zealand.

Methods

The data presented in this report is based on the information recorded on EpiSurv, the national notifiable disease surveillance system, as at 9 April 2013. Any changes made to EpiSurv data by public health unit staff after this date will not be reflected in this report.

Denominator data used to determine all disease rates in this report was derived from the 2012 mid-year population estimates published by Statistics New Zealand. Rates have not been calculated where there are fewer than five notified cases in any category.

The Fisher's exact test was used to determine statistical significance. Results are considered statistically significant when the *P* value is less than or equal to 0.05.

Streptococcus pneumoniae isolates are serotyped at ESR by the capsular antigen reaction (Neufeld test) using the Danish system of nomenclature and sera obtained from the Statens Serum Institut. Methods have not been established at ESR to identify the strain type when only pneumococcal DNA, rather than an isolate, is available. Therefore, serotype can only be determined for culture-positive IPD cases. Serotype data for invasive isolates of *S. pneumoniae* was matched with the relevant IPD case notification.

Case definition

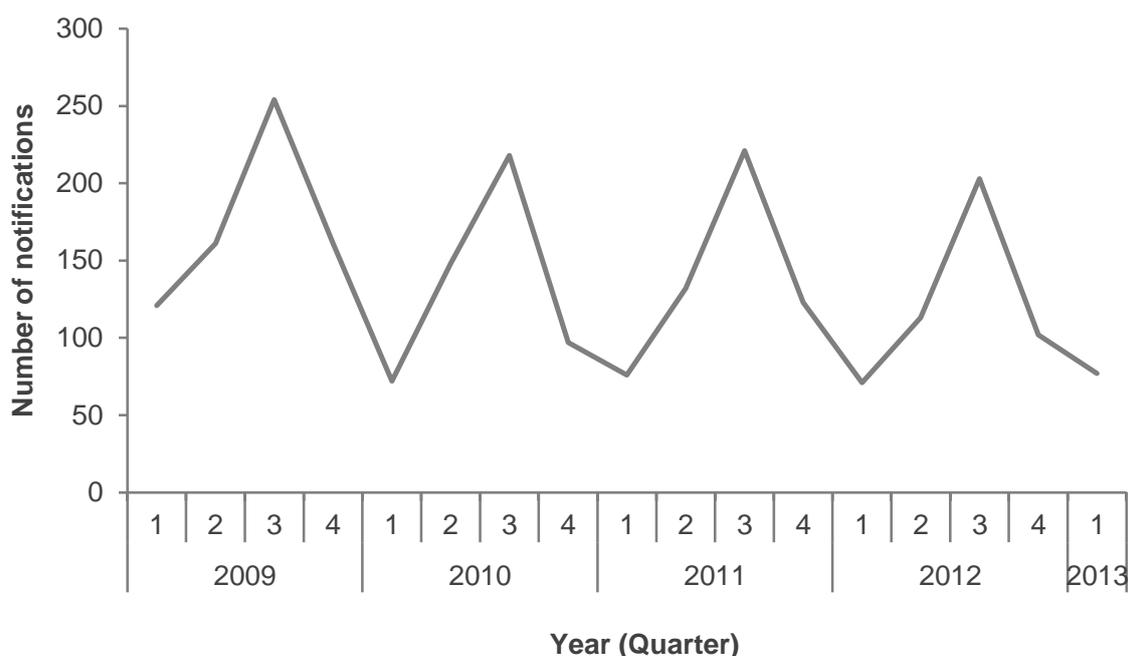
A case of invasive pneumococcal disease is defined as:

- the isolation of *S. pneumoniae* from CSF, blood or other normally sterile site; or
- the detection by nucleic acid amplification test of pneumococcal DNA in CSF, blood or other normally sterile site; or
- a positive newer-generation *S. pneumoniae* antigen test (i.e. Binax NOW) on CSF.

Results

There were 77 IPD cases notified in the January–March 2013 quarter (71 cases in January–March 2012). There is a distinct seasonal pattern with a peak in the July–September quarter and a trough in the January–March quarter each year (Figure 1). The notification rate for the latest 12-month period ending March 2013 (11.2 per 100 000 population, 495 cases) was a non-significant decrease from the rate for the previous 12-month period ending March 2012 (12.4 per 100 000, 547 cases).

Figure 1. Number of cases of invasive pneumococcal disease by quarter reported, January 2009–March 2013



The distribution of IPD cases and rates by age group is presented in Table 1. During the latest 12-month period the highest rates were in the ≥ 65 years (35.0 per 100 000 population, 214 cases) and < 2 years (33.4 per 100 000, 41 cases) age groups. Comparing the latest 12-month period with the previous 12-month period, there was a significant decrease in IPD in the 5–64 years age group (7.8 to 6.4 per 100 000) and a non-significant increase in the < 2 years age group (24.6 to 33.4 per 100 000).

Table 1. Number of cases and rates of invasive pneumococcal disease by age group

| Age group | Jan–Mar 2013 | 12 months ending Mar 2013 | | 12 months ending Mar 2012 | |
|-----------------|--------------|---------------------------|-------------------|---------------------------|-------------------|
| | Cases | Cases | Rate ^a | Cases | Rate ^a |
| < 2 years | 7 | 41 | 33.4 | 31 | 24.6 |
| 2–4 years | 3 | 15 | 7.9 | 18 | 9.6 |
| 5–64 years | 36 | 225 | 6.4 | 272 | 7.8 |
| ≥ 65 years | 31 | 214 | 35.0 | 226 | 38.5 |
| Total | 77 | 495 | 11.2 | 547 | 12.4 |

^a Rate is expressed as cases per 100 000 population.

The distribution of IPD cases and rates by region is presented in Table 2. During the latest 12-month period, IPD rates ranged between 9.7 and 13.3 per 100 000 population. There was a significant decrease in the rate for Lakes DHB (29.1 to 15.5 per 100 000) between the previous 12-month period and the latest 12-month period.

Table 2. Number of cases and rates of invasive pneumococcal disease by region

| Region | Jan–Mar 2013 | 12 months ending Mar 2013 | | 12 months ending Mar 2012 | |
|-----------------------|--------------|------------------------------|-------------------|------------------------------|-------------------|
| | Cases | Cases | Rate ^a | Cases | Rate ^a |
| Northern ^b | 26 | 180 | 10.7 | 216 | 13.0 |
| Midland ^c | 15 | 112 | 13.3 | 119 | 14.2 |
| Central ^d | 19 | 116 | 11.5 | 110 | 10.9 |
| Southern ^e | 17 | 87 | 9.7 | 102 | 11.4 |
| Total | 77 | 495 | 11.2 | 547 | 12.4 |

^a Rate is expressed as cases per 100 000 population.

^b Includes Northland, Waitemata, Auckland, and Counties Manukau DHBs.

^c Includes Waikato, Lakes, Bay of Plenty, Tairāwhiti, and Taranaki DHBs.

^d Includes Hawke's Bay, Whanganui, MidCentral, Hutt Valley, Capital and Coast, Wairarapa, and Nelson Marlborough DHBs.

^e Includes West Coast, Canterbury, South Canterbury, and Southern DHBs.

Table 3 shows the culture-positive cases due to each of the serotypes included in PCV7 and PCV10, and due to non-PCV10 serotypes. Of the 77 cases notified in the January–March 2013 quarter, 69 (89.6%) were culture-positive. The predominant PCV7 serotype reported in the quarter was type 19F (4 cases), followed by type 4 (3 cases). During the quarter there was one case of IPD due to a PCV7 serotype (19F) in the <5 years age group.

Comparing the latest 12-month period with the previous 12-month period, the number of cases due to each of the PCV7 serotypes decreased or remained the same.

The number of cases of PCV10 serotype 7F almost doubled between the last two 12-month periods (20 to 39). This increase in type 7F cases was in the ≥5 years age group.

Comparing the latest 12-month period with the previous 12-month period, there was a notable increase in the number of serotype 8 cases (11 to 19). This increase in type 8 cases was in the <2 years and ≥5 years age groups. In the latest 12-month period, serotype 19A was the most common non-PCV10 type in all age groups, and the number of cases due to this type increased by 10% between the last two 12-month periods (70 to 77). The second most common non-PCV10 type in the latest 12-month period was serotype 22F. During the last two 12-month periods, type 22F has been isolated only from IPD cases ≥5 years of age.

Table 3. Number of invasive pneumococcal disease cases by serotype and age group

| Serotypes | Age group | | | | | | | | | | | |
|--------------------------|----------------------|-------------------|-------------------|----------------------|-------------------|-------------------|----------------------|-------------------|-------------------|----------------------|-------------------|-------------------|
| | <2 years | | | 2–4 years | | | ≥5 years | | | Total | | |
| | Q1 2013 ^a | 2013 ^b | 2012 ^c | Q1 2013 ^a | 2013 ^b | 2012 ^c | Q1 2013 ^a | 2013 ^b | 2012 ^c | Q1 2013 ^a | 2013 ^b | 2012 ^c |
| 4 | | | | | | 1 | 3 | 41 | 49 | 3 | 41 | 50 |
| 6B | | | 1 | | | | 1 | 7 | 16 | 1 | 7 | 17 |
| 9V | | | | | 1 | | 1 | 12 | 13 | 1 | 13 | 13 |
| 14 | | | 1 | | 1 | | 1 | 15 | 24 | 1 | 16 | 25 |
| 18C | | | 1 | | | 1 | | 8 | 14 | | 8 | 16 |
| 19F | 1 | 2 | | | | 3 | 3 | 21 | 31 | 4 | 23 | 34 |
| 23F | | | | | | 1 | 2 | 11 | 15 | 2 | 11 | 16 |
| Total (PCV7) | 1 | 2 | 3 | 0 | 2 | 6 | 11 | 115 | 162 | 12 | 119 | 171 |
| 1 | | | 2 | 1 | 1 | 1 | | 6 | 28 | 1 | 7 | 31 |
| 5 | | | | | | | | | | | | |
| 7F | | 2 | 2 | | 2 | 2 | 7 | 35 | 16 | 7 | 39 | 20 |
| Total (PCV10) | 1 | 4 | 7 | 1 | 5 | 9 | 18 | 156 | 206 | 20 | 165 | 222 |
| 3 | | 2 | | | | | 3 | 26 | 35 | 3 | 28 | 35 |
| 6A | 1 | 3 | | | | | 1 | 6 | 7 | 2 | 9 | 7 |
| 6C | | 2 | 1 | | | | 3 | 14 | 15 | 3 | 16 | 16 |
| 8 | 1 | 3 | 1 | | | | 1 | 16 | 10 | 2 | 19 | 11 |
| 9N | | | 1 | | | | 2 | 9 | 13 | 2 | 9 | 14 |
| 10A | 1 | 4 | 1 | | 1 | | | 5 | 10 | 1 | 10 | 11 |
| 11A | | 2 | | | | | | 12 | 11 | | 14 | 11 |
| 19A | 1 | 10 | 10 | 1 | 5 | 6 | 10 | 62 | 54 | 12 | 77 | 70 |
| 22F | | | | | | | 5 | 41 | 40 | 5 | 41 | 40 |
| 33F | | | 1 | | | | 1 | 6 | 14 | 1 | 6 | 15 |
| Other types ^d | 1 | 6 | 7 | 1 | 2 | 2 | 16 | 61 | 64 | 18 | 69 | 73 |
| Total (non-PCV10) | 5 | 32 | 22 | 2 | 8 | 8 | 42 | 258 | 273 | 49 | 298 | 303 |

^a Cases reported in the first quarter of 2013 (January–March 2013).

^b Cases reported in the 12 months ending 31 March 2013.

^c Cases reported in the 12 months ending 31 March 2012.

^d Other serogroups/serotypes reported in the January–March 2013 quarter include 12F, 15B, 15 (not 15B), 17F, 22 (not 22A or 22F), 23A, 23B, 33 (not 33A or 33F), 34, 35, and 38.